

**WHAT IS CLAIMED IS:**

1. A contact plate comprising:  
a base member having a sidewall extending circumferentially around a  
5 peripheral edge portion thereof to define a sample receiving area; and  
a lid having a sidewall extending circumferentially around a peripheral edge  
portion thereof and a plurality of ribs extending from an inner surface thereof, the ribs  
being configured to provide an interference fit engagement between the sidewall of  
the base member and the sidewall of the lid when the lid is attached to the base  
10 member.
2. The contact plate of Claim 1 wherein the base member further  
comprises a contact surface extending around the sidewall of the base member outside  
the sample receiving area and wherein the lid further comprises a flange member  
15 outwardly extending from a bottom end of the sidewall of the lid and positioned to  
engage the contact surface of the base member when the lid is attached to the base  
member.
3. The contact plate of Claim 2 wherein the contact surface of the base  
20 member further comprises a plurality of ribs extending upwardly therefrom and  
positioned to engage the flange member of the lid when the lid is attached to the base  
member, and wherein the ribs extending from the contact surface of the base member  
and the ribs extending from an inner surface of the lid define an airflow passage to the  
sample receiving area when the lid is attached to the base member.
- 25 4. The contact plate of Claim 1 wherein the ribs extending from an inner  
surface of the lid are configured to provide a retention force of between about 50  
grams and about 2000 grams when the lid is attached to the base member and the  
flange member extending from the sidewall of the lid engages the contact surface of  
30 the base member.
5. The contact plate of Claim 1 wherein the ribs extending from an inner  
surface of the lid are configured to provide a retention force of at least about 50 grams

when the lid is attached to the base member and the flange member extending from the sidewall of the lid engages the contact surface of the base member independent of the rotational orientation of the lid relative to the base member on repeated attaching of the lid to the base member.

5

6. The contact plate of Claim 1 wherein the ribs extending from an inner surface of the lid taper inwardly at a first angle relative to a central axis of the contact plate and an outer surface of the sidewall of the base member tapers inwardly at a second angle relative to the central axis of the contact plate.

10

7. The contact plate of Claim 6 wherein the ribs extending from an inner surface of the lid have a height relative to the inner surface of the sidewall of the lid at a bottom end of the lid of between about 0.02 centimeters (cm) and about 0.04 cm.

15

8. The contact plate of Claim 7 wherein the ribs extending from an inner surface of the lid have a width of between about 0.04 centimeters (cm) and about 0.09 cm.

20

9. The contact plate of Claim 7 wherein the inner surface of the lid has a minimum radius about equal to a maximum radius of the outer surface of the sidewall of the base member.

25

10. The contact plate of Claim 7 wherein the inner surface of the lid has a minimum radius within about 0.03 cm of a maximum radius of the outer surface of the sidewall of the base member.

30

11. The contact plate of Claim 7 wherein the first angle is between about 3.5 degrees and about 4.5 degrees and the second angle is between about 3.5 degrees and about 4.5 degrees.

12. The contact plate of Claim 7 wherein the plurality of ribs extending from an inner surface of the lid comprises at least 4 ribs.

13. The contact plate of Claim 12 wherein the plurality of ribs extending from an inner surface of the lid comprises 4 ribs positioned about 90° apart around the inner surface of the lid.

5 14. The contact plate of Claim 7 wherein the plurality of ribs extending from an inner surface of the lid comprises at least 12 ribs.

15. The contact plate of Claim 14 wherein the at least 12 ribs are positioned at substantially uniformly offset locations around the inner surface of the  
10 lid.

16. The contact plate of Claim 6 wherein the first angle is between about 3.5 degrees and about 4.5 degrees and the second angle is between about 3.5 degrees and about 4.5 degrees.

15 17. A contact plate comprising:

a base member having a sidewall extending circumferentially around a peripheral edge portion thereof to define a sample receiving area, the sidewall of the base member including an outer surface having a maximum radius;

20 a lid having a sidewall extending circumferentially around a peripheral edge portion thereof and a plurality of ribs extending from an inner surface thereof, the sidewall of the lid being configured to receive the sidewall of the base member, the ribs being configured to provide an interference fit engagement between the sidewall of the base member and the sidewall of the lid when the lid is attached to the base  
25 member, the inner surface of the lid having a minimum radius within about 0.03 centimeters (cm) of the maximum radius of the outer surface of the sidewall of the base member, the ribs extending from an inner surface of the lid having a height relative to the inner surface of the sidewall of the lid at a bottom side of the lid of between about 0.02 cm and about 0.04 cm and a width of between about 0.04 cm and  
30 about 0.06 cm; and

wherein the ribs extending from an inner surface of the lid are configured to provide a retention force of at least about 50 grams when the lid is attached to the base member and the flange member extending from the sidewall of the lid engages

the contact surface of the base member independent of the rotational orientation of the lid relative to the base member on repeated attaching of the lid to the base member.

18. The contact plate of Claim 17 wherein the plurality of ribs extending  
5 from an inner surface of the lid comprises at least 4 ribs.

19. The contact plate of Claim 18 wherein the plurality of ribs extending  
from an inner surface of the lid comprises 4 ribs positioned about 90° apart around the  
inner surface of the lid.

20. The contact plate of Claim 17 wherein the plurality of ribs extending  
10 from the inner surface of the lid comprises at least 12 ribs positioned at substantially  
uniformly offset locations around the inner surface of the lid.

15